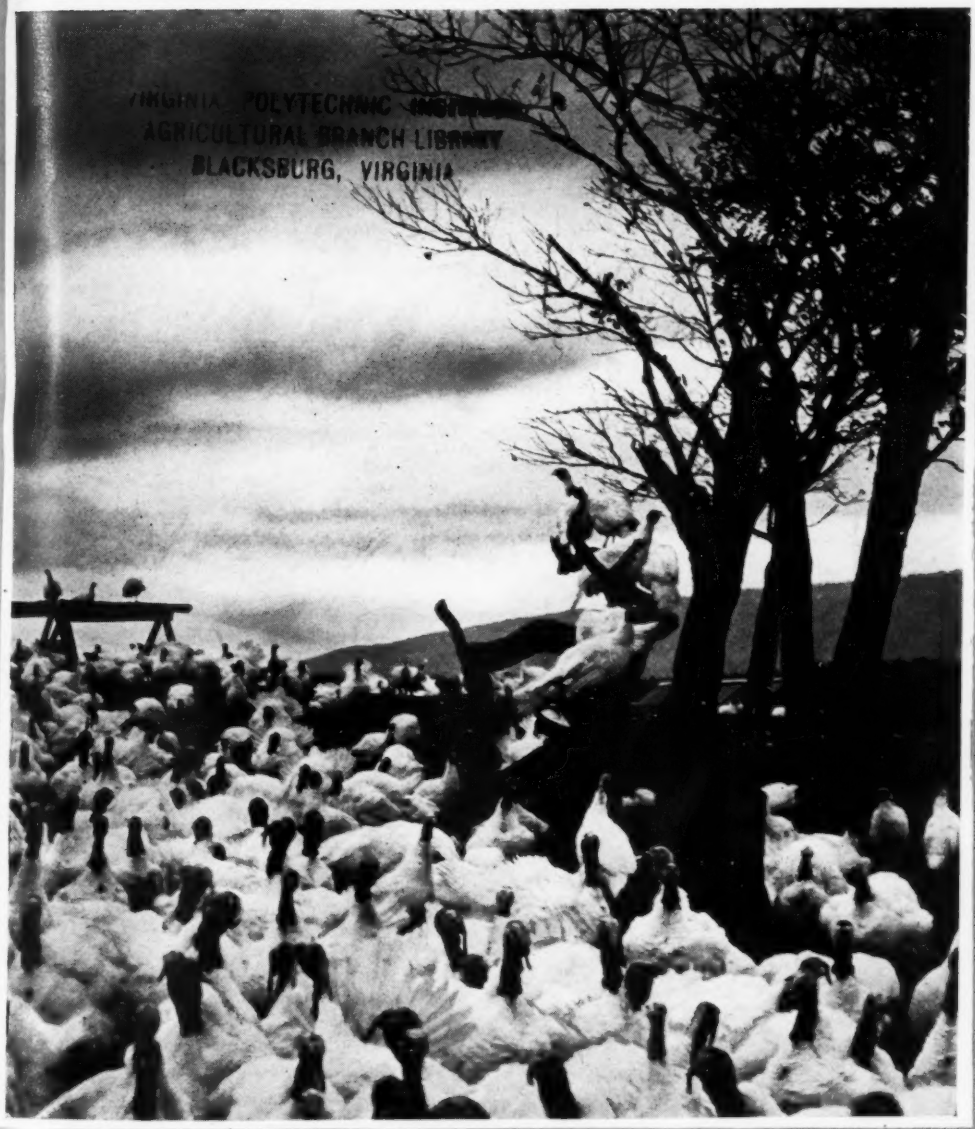
ELECTRICITY ON THE FARM *Magazine*

NOVEMBER, 1952

Current Makes Juicy Birds
Water Systems Need Air
It's Fun to Cook for Company
Poultry Problems Drop Away
Floor That Fixed a Kitchen

25th Year



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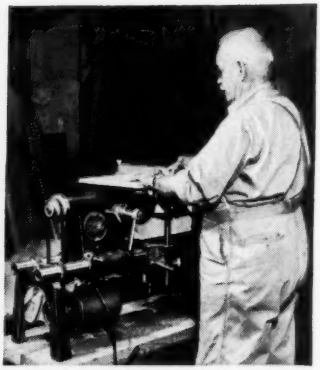

One man loads 380 bushels of ear corn per hour with lightweight portable elevator; cuts labor costs

"I've licked the problem of moving bulk materials such as litter, feed or crops from one spot on my farm to another," reports Mr. Lloyd Reiterman of Kingston, Ohio. "With my light-weight elevator, I've handled at least 100,000 bushels of corn and about 5,000 bushels of wheat since 1950."

"My truckman can put it wherever it's needed and move crops in and out of bins, cribs and trucks," continues Mr. Reiterman, "and what's more he gets much more work done than he did with a scoop shovel, and doesn't have to work so hard."

Mr. Reiterman's elevator will move up to 250 bushels of wheat or soybeans per hour, 275 bushels of shelled corn, 680 bushels of oats—at a 35-degree angle. It has paid for itself long ago in labor costs alone.

Uses newly developed motor

Powered by its extra-lightweight G-E motor (a recent G-E development) and made of aircraft-quality aluminum, the elevator weighs just over 100 pounds. A lighter-weight model, as well as various lengths and modifications are also available. For more information check "Portable Elevator" in coupon.

One man moves 380 bushels of ear corn per hour with portable elevator

"MANY TOOLS IN ONE" DOES THIS FARMER'S SHOPWORK

With a single multi-purpose machine, Mr. William L. Pettit, owner of a 400 acre farm in Davis, California, has made everything from gears and pulleys to lawn decorations.

His precision-engineered, husky compact unit, powered by a ½-HP lightweight G-E motor, includes a complete workshop of five basic tools: saw, drill, press, lathe, disc sander and horizontal drill.

No wonder he, like hundreds of farmers, thinks it's great! For information check "Combination Workshop" in coupon.

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In cold Houghton, N. Y., Mr. Arthur D. Williams protects his milking parlor from freezing and dampness with two 1500-watt electric milk house heaters.

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- ☐ Combination Workshop
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Editor's Chat

A HARVEST OF IDEAS

When we talk about ourselves here in the United States, one of the characteristics that we never overlook is that we are the "meetin'est" bunch of folks on earth. That's probably true. But did you ever stop to think that it may be one of the reasons we are so successful? We don't hesitate to get together often to sow and harvest ideas. That makes for progress. I want to pass on to you some of the ideas that I got from a group of meetings that I attended recently. Ideas that I thought you would like to know about.

Those of you who have been barn drying your hay know the value of this practice. Here is what USDA reports as a result of six years of study. "Compared with the average of all field-cured hay including rain damaged barn drying produced 12% more milk and barn drying with heat produced 17% more."

At the USDA research center at Beltsville, Md., I was among a group who were told that the light and dark periods of a day are just as important as moisture and soil fertility to plant growth. Light and darkness in prescribed doses can also perform near miracles on animals. Maybe there is something to the dark and light of the moon!

It was thought that by providing light for chickens 13 or 14 hours a day they would lay more eggs as a result of eating and drinking more. The light stimulates the chicken's reproductive organs and as a result it lays more eggs, which causes it to eat more and drink more. Pelts of mink and foxes can be brought into prime condition much earlier than normal by varying the hours of light and dark.

Getting back to plants, by the manipulation of day lengths it is possible to grow onions from seed to seed without the occurrence of bulb formation. Sugar cane flowering can be delayed by dark period interruptions with light. Strawberries produce abundant fruit when day length is 14 or 15 hours but they usually do not flower when the day length is only 10 or 11 hours. Some soybean varieties do not produce seed unless the light period to which they are exposed each day is less than 15 hours. Remember we can control the length of darkness by using artificial light.

Also at Beltsville they are experimenting to find out if heat applied to a silo will aid in producing a better quality silage. Varying degrees of heat are being applied to the outside of miniature silos.

In New Jersey they are experimenting with a new greenhouse. They want to see if it will be practical to utilize heat from the sun in conjunction with electric heat. Automatic ventilation fits into their experiments too. Rather than regular pane glass they have used large sheets of insulating glass made up of two panes with a dead air space sealed between. The results were very encouraging this past winter.

A practice by large dairy farmers in California of using bulk cooling tanks for holding their milk is beginning to be applied by dairymen in other areas of the country. Rapid development is taking place in the Northeast. One concern at Hartford, Conn. has five routes already established.

The fat test of each farmer's milk increased between one half and one point and the volume savings amount to between 10 and 12 ounces per cwt. These two factors alone account for much of the justification for the installation of bulk cooling tanks by dairy farmers, in addition to the labor saving quality improvement and general satisfaction enjoyed in this new method.

Finally a new sewerless toilet was reported at a recent Ag Engineers meeting. It has been developed at Purdue University. It disposes of its own waste so a septic tank and tile bed are not needed. This midget disposal system only consists of a toilet bowl, an electric pump, and a tank. Aerobic bacteria do the work.

As far as the application of electricity to agriculture is concerned, we have only begun to find out the real possibilities. Our harvest of ideas in this field never ceases.

Jim Ridout

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NOVEMBER, 1952—VOL. 25, NO. 9

Acceptance under section 34.64 P.L. & R. authorized at Dayton, Ohio.

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Subscription rates: $1.00 per year; $2.00 for 3 years; $3.00 for 5 years. 10¢ per copy. Bulk rates on request.

Published monthly except combination issues June-July and Aug.-Sept. by **CASE-SHEPPERD-MANN PUBLISHING CORP. Executive Offices: 24 W. 40th St., New York 18, N.Y.** KARL M. MANN, *President;* FRED SHEPPERD, *Editorial Director;* I. H. CASE. *Vice-President and General Manager.* Mid-West Office: 8 So. Dearborn St., Chicago 3, Ill. *Western Representative:* 6000 Miramonte Blvd., Los Angeles, Cal.

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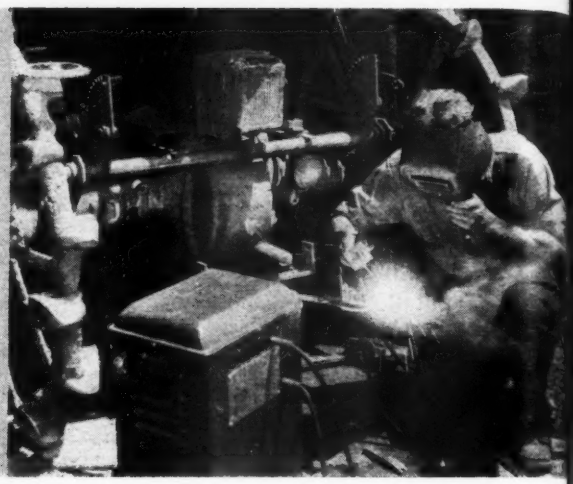

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Current Makes Juicy Birds

Turkey Growers Rely on Electric Equipment From Egg to Exit

By F. L. RIMBACH

It is amazing how many ways electricity helps the turkey grower. Perhaps that's why the turkey is such a "juicy" bird! Stuart Thurston, of Rutland, Mass., starts his 2,000 turkeys in electric brooders, having used this method for five years with perfect success. Early in the game, to stop feather picking right from the beginning, beaks are trimmed with an electrically heated cauterizing knife. The poults are kept in confinement on sun porches until they are 8 to 10 weeks old.

Floodlights Saved Birds

At that time they are put out on range which Mr. Thurston protects with four 150 watt floodlights. These are turned on just before dark and turned off again in the morning. Mr. Thurston says these floodlights have saved him countless birds. They help to discourage foxes and, in the event the birds stampede, regardless of the cause, they can see to fly back on the roost in a few minutes. Before he had these floodlights the turkeys would stampede and some would usually be crushed as the birds piled up in the dark. With the lights they simply get back on their roosts. He has used these lights for four years now and wouldn't be without them.

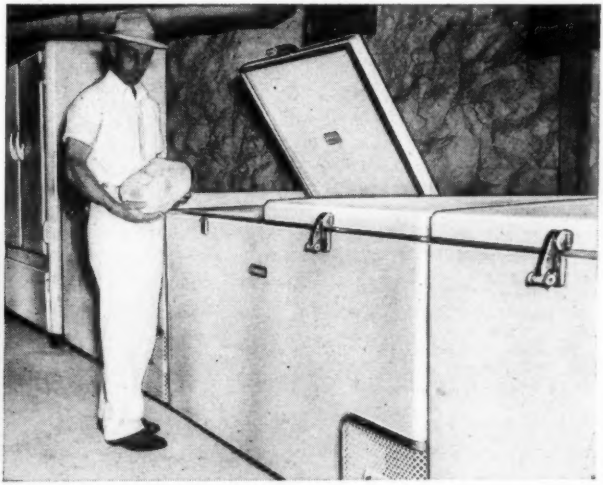
Special Wrapping Used

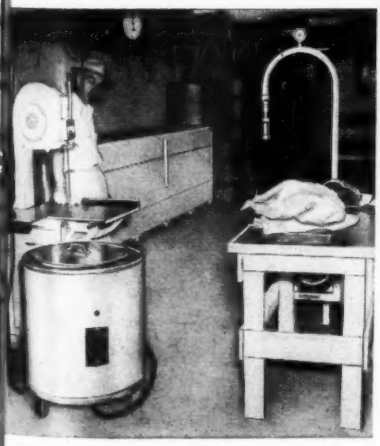
But the dressing room is where electricity really takes over. After sticking, the turkeys are dunked in an electric semi-scalder and then picked on an electric picking machine. What few feathers may be left are removed by hand with pinning knives. The birds are then put into ice water for at least three hours to remove body heat. Next, they are washed and drawn and wrapped in special individual bags. An electric vacuum machine is used to draw all the air from the bags. Then they are immersed in an electrically heated tank of water maintained at a temperature of 195 to 205 degrees. In just a second the bag shrinks and forms a skin tight covering over the bird. The birds are then put on shelves in upright freezers where they are frozen solid. From there they go to electric freezer chests for storage.

Mr. Thurston, who does most of his business at retail, figures he just couldn't be in business at all without electricity. But regardless of whether the turkeys are sold at retail or wholesale you'll find electric equipment helping to provide greater efficiency.

Brooder-Dressing House

Take, for instance, Arthur M. Goodnow, another New England farmer who produces an annual crop of 10,000 Broad-Breasted-





Above: After wrapping, the turkeys are frozen in this bank of freezers. Both upright and chest types are used. Mr. Thurston's future plans call for the installation of a walk-in storage room with full capacity for his 2,000 birds. Refrigeration is all important in turkey processing. **Left:** What a neat set up! Mr. Thurston stands behind a meat cutting bandsaw. The vacuum nozzle can be seen above the wrapping table. After air has been removed from bag in which turkey is wrapped, the whole package is immersed in hot water tank in foreground. The bag shrinks and forms a skintight covering for the bird.

Bronze turkeys on his farm near Brandon, Vermont. Some of his birds are sold at his roadside stand where he has extensive refrigerated storage facilities. However, the rest of the birds—dressed but not drawn—are packed into barrels and trucked away to wholesale buyers in large cities. One of the secrets of his success is the ease with which his 36′ x 220′ radiant heated brooder house becomes an assembly line later in the year for dressing grown birds for the holiday trade.

When ready for marketing Goodnow's birds come off the range and are temporarily housed in pens alongside the brooder building. Inside, pen partitions have been removed in order to create one large room for dressing operations.

The slaughter chamber is a small shed outside the brooder building. Even killing the birds is electrified in Goodnow's setup. It's done with a "Poultrocutor" which is run at a pace of 6 birds per minute and combines two operations in one. Throwing a switch electrocutes the birds by closing the electrical circuit. At the same time it slits the birds' throat with a sharp blade to produce bleeding. This mercifully quick operation is handled by one man who operates the machine. From there the birds slide down an inclined chute through a window into the brooder building.

Here a man picks up the birds and turns them over to a worker who is stationed at the electric semi-scalder. The scalding vat accommodates two birds at one time. The operator watches the electric clock above him, dunking each bird for 30 seconds. The water is thermostatically regulated to stay at 128 degrees.

Scalded birds are lifted to hang from shackles which move them along an overhead track temporarily installed in the building. As the birds move along, they are rough picked, the heads are washed, and a crew of women handpick remaining feathers on a piecework production basis.

After defeathering, the birds are weighed and tagged, then rolled on a cart to the chilled "hanging room" at the building's rear. Those headed for wholesale markets are packed in barrels holding between 200 and 250 pounds each—approximately 8 toms or 15 hen turkeys.

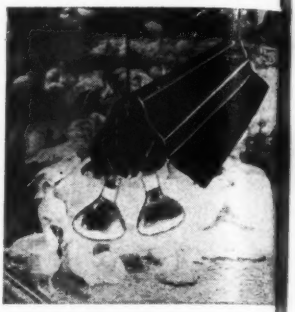
After the last Christmas birds are gone, the entire building is scrubbed, disinfected, and set up into pens again for the birds saved as breeders of the next year's flock. In a nearby building, used for feed storage and an apartment for a hired man, there is also the hatching room. There, Goodnow's pair of 11,000 egg capacity electric incubators turn out poults by the needs for his own new flock, as well as those he sometimes hatches for sale.

So there it is! Whether it's the beginning or the end, there is electrical equipment that can help the grower save time, labor and profits.

Above: In electrocution chamber outside brooder house, Goodnow's live turkeys are slaughtered efficiently and mercifully. The electric killing machine both shocks the birds and slits their throats to start bleeding. It is operated at a pace of six birds per minute.

Right: After electrocution, Goodnow's turkeys slide down a chute and through a window into the brooder house. The electric semi-scalder operator watches the clock as he dunks each bird for thirty seconds.

Behind the Cover



We thought you might like to see how those beautiful turkeys on the cover got their start in life. Here's the answer. Infra-red lamp brooders produce vigorous, fast growing, healthy birds. You may ask "What's health to a turkey this time of year?" Perhaps nothing, but it means a lot to the grower. Healthy birds are profitable birds. This picture was taken on the Inskeep Farm near Martin, West Virginia.

No need worrying about finding your station in life. Sooner or later somebody's bound to tell you where to get off.

Water Systems Need Air

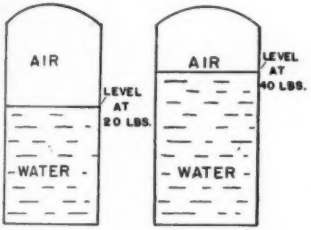
It Provides the Push That Makes Water Flow

By CLYDE WALKER

Does the pump on your pressure water system start almost every time a faucet is opened and stop soon after it is closed? If it does the pressure tank probably is suffering from a common ailment known as "waterlogging." In other words, it is too full of water.

An Air Cushion Is Essential

Water cannot be compressed, as any diver who has landed flat on the water surface can testify. Therefore in a pressure tank it



Difference between water levels at 40 and 20 pounds pressure, in a 100 gallon tank, equals 15 gallons. This is the amount that can be drawn without starting pump.

is necessary to have a cushion of air above the water; a cushion which compresses as water is pumped into the tank and expands as water is withdrawn. The larger the air cushion, the more water the tank can deliver between any given extremes of pressure.

Pressure Tanks Can Deliver Only Part of Total Capacity

Only a fraction of the total pressure in a tank is effective for forcing water through the system, since the rate of discharge from the system decreases rapidly as the pressure drops. Most home water systems have pressure switches adjusted to start the pump when the pressure drops to 20 pounds and stop it when it reaches 40 pounds.

If we start with an empty tank and pump water in it until the pressure gauge reads 20 pounds per square inch the tank will be 58% full. Thus a 100 gallon tank will contain 58 gallons.

If more water is pumped in until the pressure is 40 pounds, the tank will be 73% full, so a 100 gallon tank will contain 73 gallons.

The difference between 73 and 58, or 15 gallons, is the usable capacity of a 100 gallon tank between pressure of 20 and 40 pounds. A 42 gallon tank, the size used in many domestic water systems, can deliver about 7 gallons between pressures of 40 and 20 pounds.

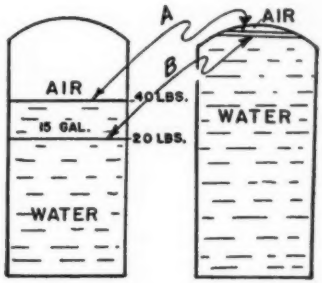
Water Absorbs Air Under Pressure:

Unfortunately, the size of the air cushion above the water will not remain constant. Water absorbs air under pressure. This continually reduces the volume of air in a pressure tank as water containing air is drawn from the tank. Finally the air cushion becomes so small that merely drawing off a glass or two of water will cause the pressure to vary over 20 pounds, resulting in motor starting and stopping.

Air Injection Devices

Water system manufacturers are aware of this situation, and usually provide some method of replenishing the air in the tank.

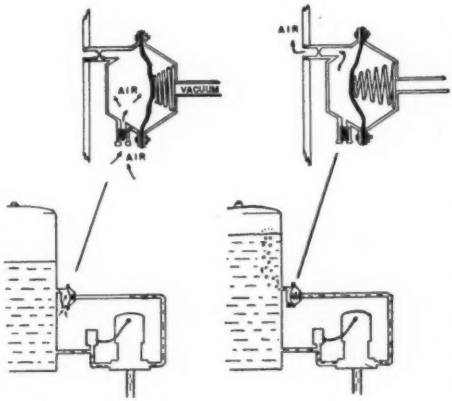
One method of controlling the volume of air in a pressure tank frequently used is to have an air valve controlled by a float inside the tank. When the water level in the tank rises too high the float opens the air valve and permits the pump to "sniff" air,



Water level in the tanks at 20 pounds and 40 pounds pressure per square inch. The one on the right is waterlogged. The pump will start as soon as a faucet is opened.

which is carried into the tank with the water. Incidentally, when the valve core on this type of installation finally wears out and begins to leak, it should not be replaced with a tire valve core. The tire valve core has a stronger spring and the pump cannot suck air through it. Obtain a valve core from a pump dealer, one that is designed to replace the original part in the pump.

Another method is to have the pump injecting some air into the tank whenever it operates.



Diaphragm air control. When pump starts (left) suction causes diaphragm to draw air into the chamber. When pumps stops, the spring pushes the air into the pressure tank.

When the water level in the tank drops too low, a float opens a valve and permits the excess air to escape from the tank.

Still another method is to use a diaphragm-operated control. When the pump starts it creates a vacuum in the diaphragm chamber, which is attached to the pressure tank. This pulls the diaphragm to one side, compressing a spring and drawing air into the chamber through a small valve in the bottom. When the pump stops, the spring pushes the diaphragm in the opposite direction, forcing the air into the tank.

Like any mechanical device, air volume controls may fail to function properly at times. Adjusting or replacing them should be done by a pump dealer's service man, or a competent mechanic. If such help is not available consult the manufacturer of your pump. He may be able to furnish instructions that will enable you to do the job yourself. Usually the instruction book supplied with a water system explains the operation and adjustment of the air volume control.

If frequent starting and stopping when small quantities of water are withdrawn indicates that your water system is waterlogged, take steps to correct the condition. As time goes on it will get worse instead of better. The frequent starting and stopping causes undue wear on the pump, motor, and automatic pressure switch. If allowed to continue, it ultimately will result in failure of some of the parts, with the resulting inconvenience and expense for repairs. So, if your water system pressure tank is waterlogged, "give it air."

If the system is equipped with an automatic air volume control, make sure that it is functioning properly. If the tank still becomes waterlogged from time to time, additional air must be supplied. One simple way to accomplish this is to shut off the motor, then remove the plug from the pressure tank and allow all of the water to drain out. When the tank is empty, replace the plug and turn on the motor. This gives the system a new start with a tank full of air. Another method is to obtain a valve stem fitting such as is used as the "snifter" valve on piston-type pumps. Connect this fitting into the supply-pipe to the tank at any convenient point. An ordinary tire pump then can be used to pump additional air into the tank from time to time as needed. Obviously, it is easier to do this when the tank pressure is down to 20 pounds.

Regardless of the method used be sure to renew the air cushion in a water-logged tank. Allowing it to operate in a water-logged condition means unnecessary trouble, inconvenience and expense.

Waxing Increases Value

Waxed vegetables aren't exactly new. Housewives have been paying a premium for them for years. They have eye appeal and the wax has a preservative effect. They do not dry and shrivel as rapidly as unprocessed vegetables. What's more the wax provides a profit for the processor, by means of the increased crop value.

Too often this processing is done by someone other than the original farmer. Yet farmers can well afford to do this processing, thereby increasing their share of the consumer's dollar.

This automatic waxing machine on the William O. Bussey farm processes 150 bushels of sweet potatoes an hour and increases their value by as much as $1.00 a bushel.

As an example, early this year William O. Bussey of Severn, Maryland, installed an automatic electric machine to clean and wax sweet potatoes. This modern equipment adds as much as a dollar a bushel to the value of his sweet potatoes, depending on market conditions. It performs the work of cleaning and waxing, is entirely automatic, and processes 150 bushels an hour. That is many times faster than the work could formerly be done by hand.

Potatoes loaded on a conveyor at one end of the machine have their roots broken off. Next, they are scrubbed clean by 8 rotating brushes and are dipped in a food wax solution. This increases their market life by about a week and leaves them glistening and protected against moisture loss and shrinkage. The automatic equipment is so thorough in its work and brings such wonderful results that Mr. Bussey plans to use it for processing peppers and cucumbers which are also grown on his 350 acre farm.

Poultry Problems Drop Away

With This Self Cleaning Droppings Pit

By ALBERT S. MOWERY

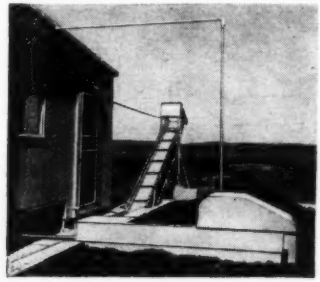
In the spring of 1950 the Pennsylvania Agricultural Experiment Station developed a "Poultry Utility Unit". With this experimental unit it was possible to feed water and roost the birds above the dropping pit. This made it possible to use a mechanical cleaner to remove the droppings voided by the birds where they ate, drank and roosted.

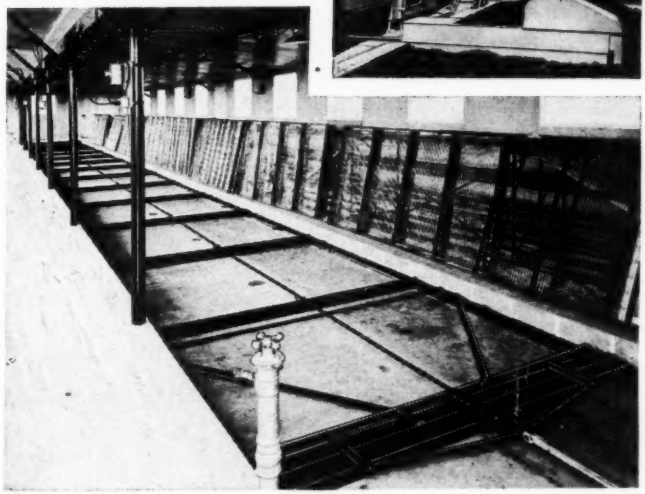
Normally, droppings are voided in all areas of the poultry house pen but they are concentrated in the pits and around the feeders and drinking fountains. In a recent study at Penn State it was found that when layers were roosted over a pit and fed and watered in the litter area, which is the conventional method, that about 35% of their droppings were collected in the pits. However when the utility unit was used about 75% of the droppings were collected in the pit.

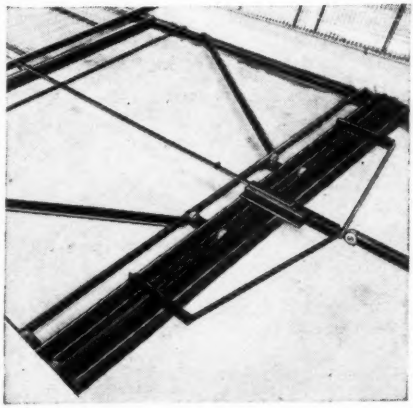
Wet litter and dirty eggs have plagued market egg producers since the beginning of commercial poultry business. Since 100 layers void about 38 lbs. of droppings daily containing 75% water, it is easy to explain the wet litter problem. In effect this is the same as pouring 14 quarts of water into the litter per day, per hundred layers. Additional sources of moisture which cause wet litter, are the spillage around water fountains and the vapor given off by the birds through respiration. However, that given off in the droppings is probably the major cause of wet litter. Excessive amounts of ammonia fumes have been serious enough to cause blindness in chickens and in addition make it highly unpleasant for the workers. Ammonia fumes and wet litter seem to go hand in hand.

Spillage of water at the watering fountains can be corrected by using certain types of waterers, and the vapor and foul air caused by respiration can be removed by a ventilation system. However, in the past it has been difficult to remove the moisture and ammonia fumes caused by the droppings. Now the mechanical cleaner along with the utility unit makes it possible to cope with the major cause of wet litter.

As an outgrowth of our experience with the utility unit, a 92′ scraper-type cleaner was developed to be used in the new Solar Experimental Poultry House at Penn State. This cleaner, in operation since September 1591, is working quite satisfactorily. It is a reciprocating, scraper-type that fits into

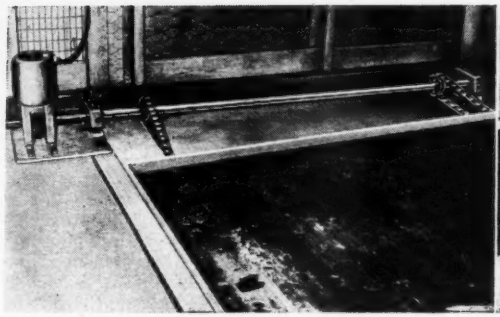




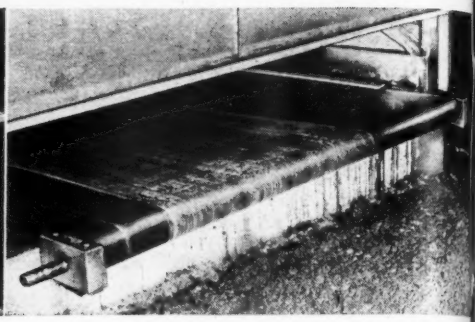


Top: The elevator for transferring the droppings to spreader and the main power unit are outside the building. A 1½ hp motor drives the draw bar through its 8 foot reciprocating stroke.

Above: The horizontal scrapers, pivoted at each end, are spaced 7′ apart. The roosts, leaning against the wall, are placed over the pit which extends the full length of the building. **Left:** The draw bar, right, is connected by a yoke to a length of 3″ channel iron. This pulls, or pushes, against rubber bumpers on header bars which are far enough apart to allow 3″ of free travel between strokes. During this time the drawbar, by means of the draglink, raises or lowers the scrapers depending on direction of stroke.



Power end of over-and-under belt type cleaner. Note, the sprocket chains are attached to each end of the belt near the sides. Gear motor drive is reversible.



At the discharge end, the belt-type cleaner runs over a roller made of four inch pipe. The belt cleans itself again the end of the pit.

a pit 8′ wide running the full length of the house. It slides back and forth on 2 x 4's mounted at the sides of the pit.

This cleaner, constructed of angle iron, flat iron and sheet metal, is not manufactured commercially at the present time. It does lend itself to home made construction as well as to a factory made product. Here's the way it operates.

On the forward stroke the scrapers push the droppings forward. Then, on the return stroke, the scrapers are lifted and pass back over the top of the droppings. The scrapers then drop back into a vertical position for the next forward stroke.

The 92′ cleaner in the experimental house is driven by the 1½ HP reciprocating power unit from a dairy barn gutter cleaner. This type of power unit provides a very long, slow, even stroke. With its 8′ stroke-length a scraper spacing of about 7′ is used. This permits the scrapers, which are 5½″ high to clear the litter on the return stroke. In actual practice it takes about 14 to 15 strokes to clean the 92′ pit. Since the unit travels at a rate of about 23 seconds per complete stroke, it takes less than 6 minutes to clean the pit. As a matter of convenience and to save labor a cross elevator at the end of the building is used to dump the droppings into a manure spreader.

The draw bar from the power unit raises or lowers the scrapers before moving the cleaner in either direction. This is accomplished by leaving a 3″ clearance between the draw-bar yoke and the header bars of the cleaner. This allows 3″ of free travel for the draw-bar between strokes. By means of a drag-link, connecting the draw-bar to a lever on each scraper, the scrapers, pivoted at each end, are raised or lowered. This assures positive cleaning action with each stroke.

Scraper type cleaners are limited in use by the condition of the floor of the pit. Therefore, a belt-type cleaner was developed to meet the needs of certain poultry housing conditions. The first of this type cleaner consisted of a rubber covered canvas belt which wound on a 4″ pipe reel. Some difficulty was experienced in winding up this belting, so a second belt-type cleaner was developed. This cleaner has not been in operation long enough to prove itself but it appears to offer real possibilities.

Actually this belt cleaner is constructed similar to an experimental model of a commercial belt-type dairy barn gutter cleaner. The belting lays in the pit with the sprocket chain on the under side of it. The chain is connected to each end of the belting. A gear motor with a reversing switch is used to power the sprocket drive shaft. In operation the chain pulls the front end of the belting out over a 4″ pipe head-roller. It continues back into the building until the belting is upside down in the pit with the chain on top. Then the operation is reversed and the chain pulls the belting back into proper position. The edge of the pit acts as a scrape to clean the belting.

More Information Available

If you are interested in co struction details for the scrape type of cleaner, write to th Agriculture Mailing Room, Th Pennsylvania State College State College, Pa. Ask for th progress report on "Mechanic Cleaner for Dropping Pits."

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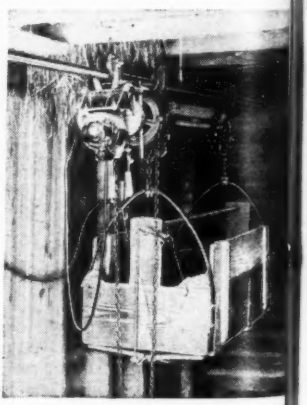
Electricity raises or lowers th homemade feed car on Walte Breyfogle's farm near Crown Point Indiana. A standard power unit i attached to the carriage of a regu lar litter carrier hoist. The car ha



a hinged bottom which is hel closed by a wire latch over th crank handle. When the full car i in position over the cattle feedin bunks, a flip of the latch dumps th load.

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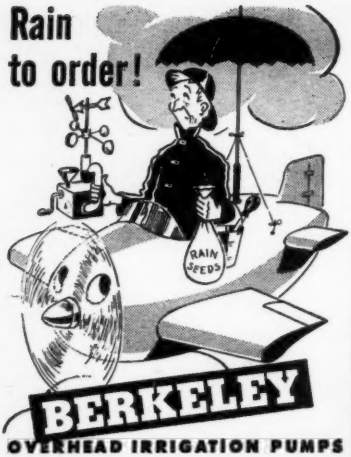

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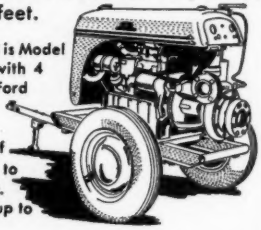

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Bright Future for Pumped Heat

Refrigeration Equipment May Hold the Answer to Greater Comfort and Better Farming Methods

By H. S. HINRICHS

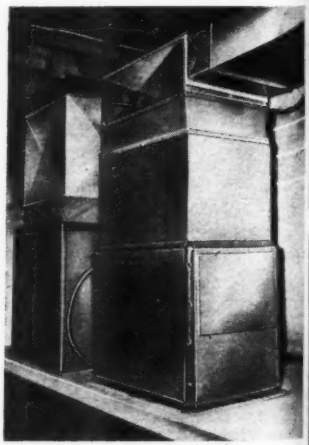
The availability of electric service to most farms in the United States is not only modernizing farm family living,

The Darrel Dunn farm home near Langdon, Kansas, is not small. However, a 7½ hp heat pump provides plenty of warmth in winter as well as refreshing coolness in summer.

but is also providing a basis for new methods in the production, storage and processing of farm products. Recent developments in the wider utilization of the "Heat Pump", indicate that this device will be an important factor in the modernizing process.

The heat pump is an electrically driven device that can be used for cooling or for heating without combustion. The heat pump itself is not new. The principle was tried experimentally a hundred years ago. The development of mechanical devices to apply the principle to everyday living, however has paralleled the widespread distribution of low cost electric power. The popular acceptance of the heat pump for cooling (mechanical refrigeration) has all occurred during the past twenty-five years. The household refrigerator, home freezer, milk cooler and summer airconditioning of homes, offices, or stores, are specific examples of such application. The practical use of the heat pump as a means of supplying heat as well as cold, or for controlling moisture conditions, however, is just beginning to be appreciated by the general public. A realization that one kilowatt hour of electricity can pump several times as many heat units from one location to another as the same quantity of electricity can deliver when converted directly to heat, serves to emphasize the possibilities in this field.

One of the most fascinating uses of the heat pump is for year round comfort conditioning of homes. It can provide heating in winter as well as cooling in summer. This application has reached a substantial acceptance particularly in mild climates where summer cooling is most desired, and where winter heating requirements are moderate. Such conditions lend themselves readily to the heat pump. First, because the unit large enough for summer cooling is also adequate for winter heating. Furthermore, in such areas the outside air provides an adequate source of heat for winter operation. Past experience has indicated that for colder climates, the heat pump was not practical unless some other source of heat was available, such as water



When it's all together, the heat pump in Mr. Dunn's home looks like any conventional heating plant.

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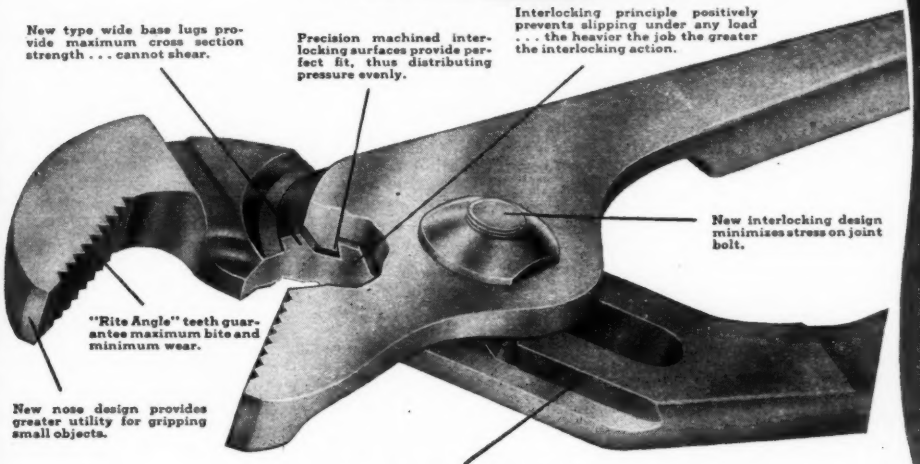
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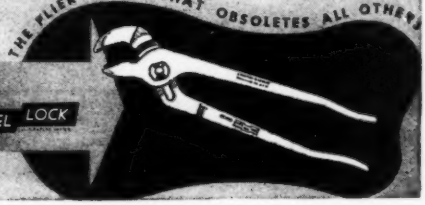

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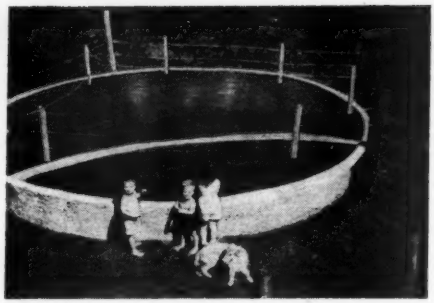

During the winter, water discharged from the heat pump flows into this stock tank. It supplies water to 400 head of cattle and remains ice free. In summer the water is used to irrigate the gardens around the house.

from wells or the earth itself. In those areas where an ample supply of ground water is available that can be pumped at a reasonable cost, the heat pump has proven entirely satisfactory for winter heating. Recent developments indicate that the air as a source of heat may prove to be economical in colder climates than heretofore was deemed practical.

In the fall of 1949 heat pumps using water from wells as the heat source were installed in three Kansas farm homes, two in the general vicinity of Hutchinson, Kansas, and one near Clay Center, Kansas. Three additional units were installed in residences in Hutchinson, Kansas. At that time a joint investigation for the purpose of studying performances and operating characteristics of these units was initiated by Kansas State College, The United States Department of Agriculture, and The Kansas Committee on the Relation of Electricity to Agriculture. Units in all six homes were studied with special tests being conducted in three of them. One of these units installed in the farm home of Darrel Dunn near Langdon, Kansas, is particularly significant. This residence is a large, ten-room, two story frame house with half basement. Only the attic is insulated, but the house is well constructed and in an excellent state of repair. Aluminum storm sash were installed on all windows. The heat pump was a 7½ hp. standard production model. The amount of electricity used during two full years was as follows:

Kilowatt Hours Consumed

	For Cooling in Summer	For Heating in Winter
1950-51	1666 kwhr	15,653 kwhr
1951-52	2124 kwhr	17,003 kwhr

After three years' experience with the installation, Mr. Dunn says:

"The heat pump has certainly been a great satisfaction here in the last sixty days of extremely hot weather. It has been most satisfactory for both heating and cooling this large home. I feel that it would be a great mistake to plan a new home, where water and a fairly low rate for electricity is available, without giving consideration to heat pump installation. Cooling, I believe, will become as important, as a health factor, as heating."

Another installation in a six room, single story moderately insulated, ranch type farm home with small basement used approximately 10,900 kwh during the 1950-51 heating season, 2035 kwh during the summer of 1951, and approximately 10,700 kwh during the winter of 1951-52.

A third unit installed in a seven room, well insulated, ranch type farm home with full basement, required 822 kwh for cooling during the summer of 1951 and 5395 kwh for heating during the 1951-52 winter season.

The report of this investigation states,

"The data collected indicates that the heat pump in Kansas can compete favorably in operating costs with systems using fuel oil and liquefied petroleum gas. It is entirely possible that with proper system design, the heat pump can be made to operate more economically than systems using either fuel oil or liquefied petroleum gas."

It is not necessary to fully understand all of the technicalities of the refrigeration cycle in order to evaluate the heat pump. It is important, on the other hand, to know something about how it works in order to appraise its potential applications.

All Substance Has Heat

The first important fact is to realize that there is some heat in every substance even though it normally is thought of as being cold. There are some heat units in air even though the

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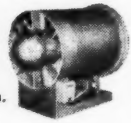

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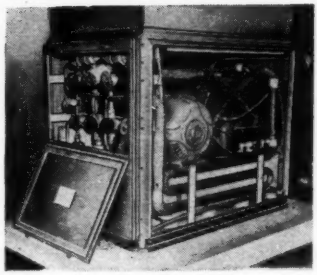
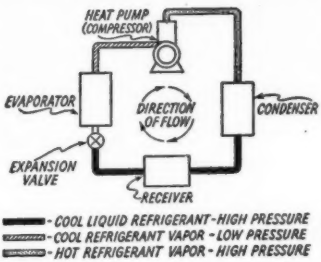
temperature may be 20 degrees below zero. There are heat units in ice. The second fact to recognize is that heat normally flows from a warm to a colder substance just as water normally flows down hill. The heat pump is used to pump heat from a cold to a warmer substance just as a water pump forces water from a lower to a higher elevation—up hill.

A third essential fact is that the form of certain substances changes as the temperature or pressure is modified. For example, water is normally a liquid, but changes to a solid (ice) when the temperature drops below 32 degrees. On the other hand, it changes to a vapor or gas (steam) when the temperature exceeds 212°.

The fluid used in a heat pump system (called a refrigerant) is a substance that readily changes from a gas to a liquid and back again as the temperature or pressure is changed. When the refrigerant changes from a liquid to a gas it absorbs heat from surrounding substances, and when it changes from a gas to a liquid it gives off this heat to the surrounding substance.



When you remove the covers of the heat pump it looks pretty complicated. However, the principle is simple, as shown in the diagram. Actually the refrigerant simply carries heat. It picks it up from water or air at the evaporator and delivers it to water or air at the condenser. Heat has not been manufactured. It has simply been transferred from where it isn't needed to where it will do some good.



The heat pump system then consists of six essential units:

1. The *refrigerant* that carries the heat throughout the heat pump system.
2. A regulator, called an *expansion valve* that controls the flow of the refrigerant.
3. A radiator like device that permits the refrigerant to pick up heat, called an *evaporator.*
4. A *compressor,* or pump for circulating the refrigerant.
5. A second radiator that permits the refrigerant to give off its heat, called a *condenser.*
6. A storage tank for the surplus refrigerant called a *receiver.*

Now let's examine each of these elements as they exist in the ordinary household refrigerator. The compressor and receiver are located in the lower part of the unit out of sight behind the vegetable drawer. The

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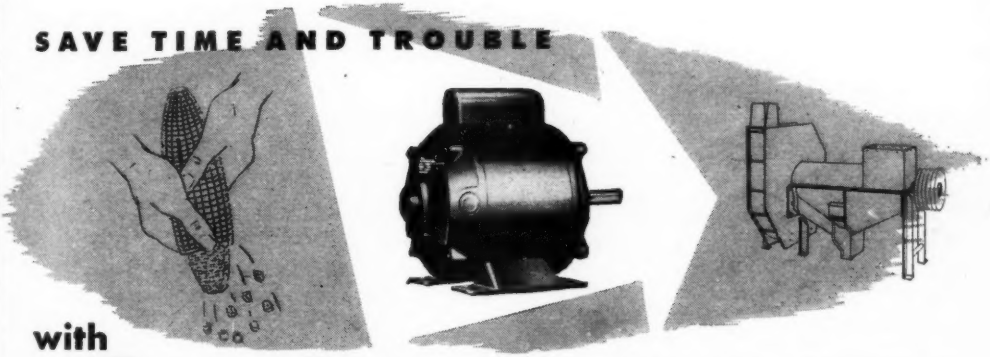

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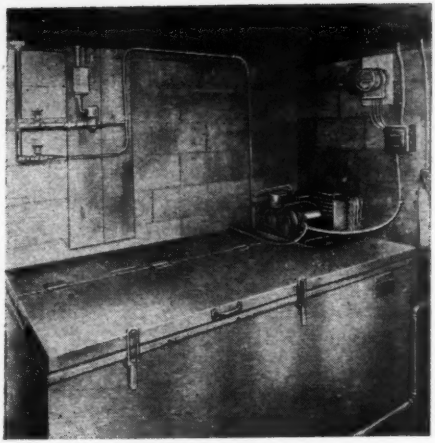


The refrigeration unit on this milk cooler does double duty. Besides cooling milk, it heats the milkhouse. That water pipe on the wall has a solenoid valve in it. When the thermostat calls for heat, the valve opens allowing water to flow into the cooler. The compressor pumps heat from the water and thereby warms the room.

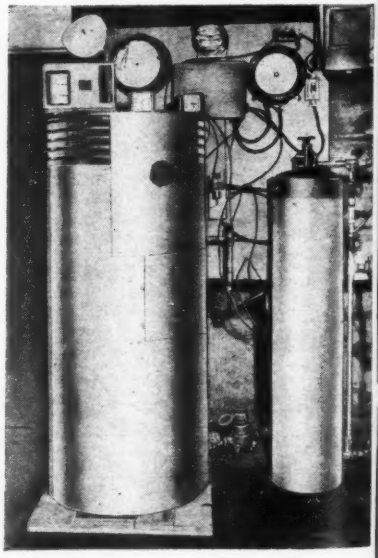
evaporator is the freezing unit within the box, and the expansion valve is usually located near this evaporator. Few people probably have ever noticed the radiator mounted on the back of the refrigerator cabinet next to the wall, but that is the condenser.

The heat pump system simply pumps the heat out of the refrigerator cabinet, into the kitchen. Here's how. Liquid refrigerant is stored in the tank or receiver under pressure. When the temperature within the refrigerator rises, the expansion valve allows some of the liquid refrigerant to pass into the evaporator (freezing unit) where there is so much less pressure that the liquid immediately boils and vaporizes. In the same manner that heat is required to boil water, heat is required to boil the refrigerant. In this case, the refrigerant boils at such a low temperature that the heat in the food stored in the refrigerator cabinet or in the water in the trays is sufficient. In other words, the refrigerant absorbs the heat from the surrounding substances.

When the refrigerant has picked up its load of heat, it flows to the compressor where it is again put under pressure. When compressed, the refrigerant vapor or gas becomes hot. This hot gas under pressure passes to the condenser mounted outside of the refrigerator cabinet, where the refrigerant gives off its heat to the air in the kitchen, cools to a liquid and returns back to the receiver, completing the cycle. Refer to line sketch on page 15.

In the household refrigerator, the evaporator was designed to transfer heat from the air in the box to the refrigerant. The condenser in turn was designed to transfer the heat from the refrigerant to the air in the kitchen. The heat was pumped from the air in the box at a low temperature to the air in the kitchen at a higher temperature.

In other applications of the heat pump, the design of either the evaporator or condenser or both is so modified that the refrigerant may pick up heat from, or release heat to, substances other than air. The milk cooler removes heat from water surrounding the cans of milk, and discharges its heat into the air. Thus we have a transfer of heat from water to air. In a heat pump water heater, heat is absorbed from the air and pumped into the water in the tank, a transfer from air to water. The several components of the heat pump system are already available in such a wide variety of types, sizes and design, that a selection of suitable units makes it possible to adapt the heat pump to any number of heating



This experimental heat pump water heater is installed near Manhattan, Kansas. The extra charts and instruments are being used to keep accurate records of its operation. Actually, the complete unit is in tank at left. Tank on right is water softener.

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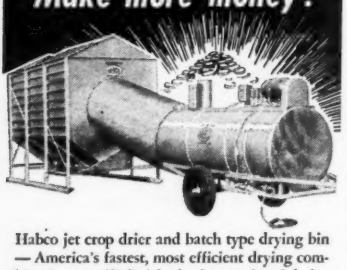

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as well as cooling applications.

A vast amount of research has been devoted to the problems incident to the use of this refrigeration cycle for heating. Such experimental work indicates the practicability of using the heat extracted from the milk by the milk cooler for preheating the hot water supply for the dairy. Other tests use the heat pump on the milk cooler for heating the milk house in winter.

A start has been made in the manufacture of heat pump for supplying hot water for household use. A limited quantity of such units have been field tested and a larger number of improved units are now undergoing further test.

Heat Pumps May Dry Grain

Another application of the heat pump is the control of humidity, that is, the quantity of moisture in the air. This not only provides an added human comfort in the air conditioning of homes, but it is an important factor in the growth of molds and other destructive organisms. A number of leading manufacturers are producing "dehumidifiers" which are heat pumps designed for the purpose of removing moisture from the air. Many of these units are successfully drying damp basements. This process is based upon the fact that cold air cannot hold as much moisture as warm air. Everyone is familiar with the way in which moisture collects on the outside of a cold glass of water in the summer. The dehumidifier simply makes this a continuous process. The warm air passing over the cold coils (evaporator) of the dehumidifier is chilled. The moisture collects on the cold surface and drains into a container provided for the purpose. The possibilities of further use of this feature of the heat pump are indicated in a research project just getting under way that proposes to determine the practicability of dehumidifying the air used in drying grain, instead of using heat in the process. The condensation of moitsure in dairy barns during the cold weather is a difficult problem to the dairy farm-

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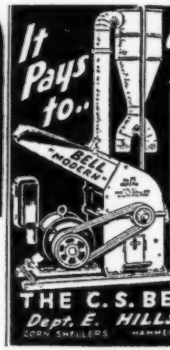

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er. The electric dehumidifier may eliminate the trouble.

This combination of temperature and moisture control made possible by the heat pump, supplies an interesting forecast of revolutionary changes in standards of living comfort and farm production methods. In the farm home of the future one heat pump may take the heat from the refrigerator and the home freezer and deliver it to the water heater as well as provide year round living comfort. There is no practical reason why a heat pump cannot be used to automatically maintain uniform temperature and moisture conditions in vegetable or fruit storage rooms throughout the year—heating in winter, cooling in summer. It is possible that animal comfort materially affects meat or milk production. Experiments are in progress to determine the effect of temperature and humidity.

The extent to which any or all of these applications may be adopted cannot of course be predicted at this time. The rapidity with which those uses that prove to be economically sound will be generally accepted, is not now discernable. The future potential effect of the heat pump is tremendous. This applies to both the farm home, and to farm production.

Upside Down Silo

Saves Freezing—Hoist Saves Back

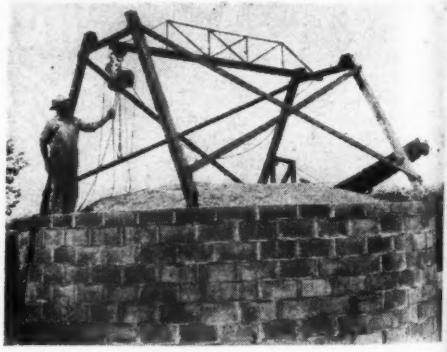
By HERBERT JONAS

Henry Alexander of Granger, Washington, put his silo underground primarily to protect ensilage from freezing solid during the zero weather. However, he found that he saved on building costs because he eliminated scaffolding during construction and required less reinforcements for the concrete block masonry. The silo is 18′ across, 21′ deep and holds 100 tons.

The problem of unloading the silo was solved by using an electric chain hoist provided with a half-ton capacity dump bucket. The hoist rides back and forth on an I-beam which is supported by a double A-frame set on top of the silo curb. Thus the bucket and hoist can be moved back and forth across the silo. This saves steps in shoveling ensilage into the bucket.

When feeding time rolls around the operator goes down into the silo. After filling the bucket he either climbs a ladder or rides the bucket back to the top of the silo. The bucket is positioned over a horizontal conveyor, the trip rope is pulled, and the silage, dumped on the conveyor, is carried into the tractor-drawn trailer for a trip to the feed lot.

Editor's Note: Caution should be observed in entering such a silo. Gasses which may be present are heavier than air and cannot drain off as they can in an above ground silo. One way of checking the presence of such noxious gasses is lowering a lighted lantern into the silo. If the flame goes out a fan or some other means of exhausting the gas should be employed before going down into the silo.



We know a DENTIST who recently married a MANICURIST but wedded life didn't go so well for them—now they're fighting TOOTH and NAIL .... POLITICAL SPEECH: PATTER of LITTLE FEATS .... BENNETT CERF tells us that there's a rumor that the manufacturers of SERUTAN are planning a new program to be heard every Tuesday from 9:30 to 9 .... Ad for a FLOOR WAXER—"REWAX and ENJOY IT." .... PSYCHIATRIST: MIND SWEEPER .... OVERHEARD: "You SWINDLER! When you sold me this ranch, you SAID I could grow nuts on it!" "You misunderstood me—I said you could go nuts on it." ... MASSEUR: a LIMBERJACK .... PIG PEN: GARBAGE DISPOSAL UNIT.... SODDEN THOUGHT: About the ONLY fellow who STARTS at the TOP of the ladder is the fellow who cleans SEWERS .... "WHAT happened when the burglars broke into your home?" Mr. Henpeck: "My wife's relatives yelled 'WE were HERE first' and chased them out." .... It DOESN'T pay to judge power by size—sometimes even a WOMAN'S THUMB has a man under it .... About the worst thing we can think about football is that none of the cheer leaders ever get injured .... The grapevine brings us a story about a TUBA player who lost his toupee in the instrument and spends his working hours BLOWING his TOP. (Caw! Caw!) .... FUR COAT: a winter RESORT .... SOME minds are like CONCRETE—MIXED UP and PERMANENTLY SET .... Friend of ours says his lil wifie is a VERY systematic person—she works on the theory that you can FIND whatever you want when you don't want it by looking where it WOULDN'T be if you DID want it .... SHORT-SHORT STORY DEPT.: Once upon a time there was an ELECTRIC RAZOR who married a DOORBELL—naturally their first son was a HUMDINGER .... SNICKERSNORT-OF-THE-MONTH: His little wife had been quite disdainful since their little disagreement. "Why don't you come down off your high horse?" growled hubby. "THAT'S your biggest trouble, Fred, you're SO old-fashioned," retorted his modern wife. "WHY don't you learn to MOTORIZE your thinking?" .... DUFFY.

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Electrical Housekeeping

Edited by NAN SHAW, 329 Memorial Union, Ames, Iowa

It's Fun to Cook for Company

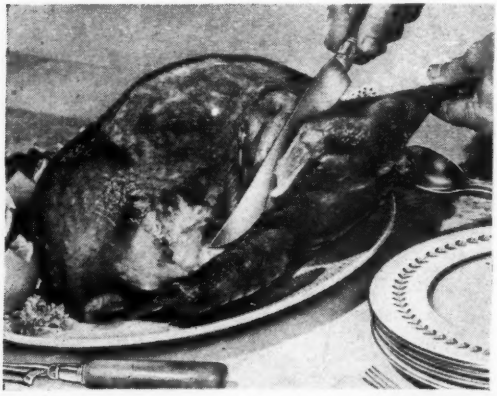
Let Them Share the Fun by Helping

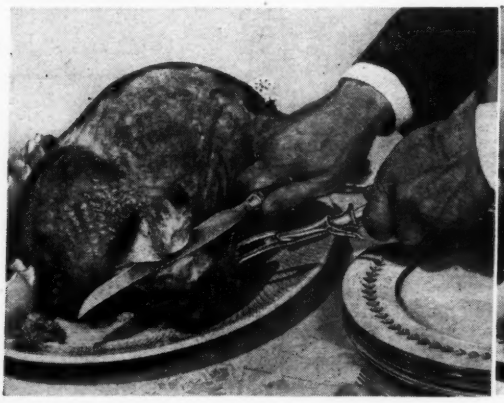
One thing we can be sure of even in uncertain times is that Thanksgiving Day will be company day wherever the Stars and Stripes go up a flagpole. It's as natural as breathing for Americans the world over to plan for special and extra foods to be prepared for tables which will be extended their full length because company is comin'!

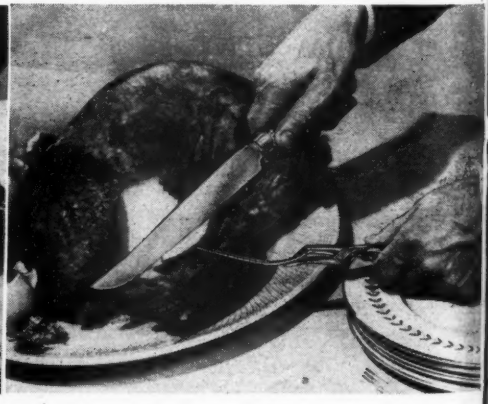
And right now is the time to get ready for this company day. Perhaps you have an established routine you follow year after year, but many folks will be celebrating Thanksgiving for the first time in their own house with the in-laws, relatives, new and old friends gathered around the table.

To start with, make up your mind that you'll let everyone in the family somehow have a part in the Thanksgiving Day turkey, from purchasing it to putting it on the table. By all means, don't be a selfish cook, but share the magic transformations which occur to that turkey in your electric roaster or range oven!

It might not be the most practical suggestion, but it will establish long lasting and nostalgic memories if you work out at least one peeking time for your turkey. Let the family know at what time they can expect a signal to rush into the kitchen to take deep inhalations of the bird's aroma and guess how much longer they think it might be before they can eat. And if their fingers itch to do so, give them the pleasure of spooning a little basting essence up and over the bird. This of course is not necessary as far as a well finished bird is concerned, but half the enjoyment of anything







Upper left: Place the bird so that the breast is toward the left of the carver. To start carving, place the knife between the thigh and body and cut through the skin to the joint. Separate by pressing the leg outward with the knife and bending the leg back with a fork. The drumstick may be served whole or the dark meat may be sliced for service on each plate. **Lower left:** The wing may be disjointed and separated from the body the same as the leg or it may be left on the bird to give balance during the carving. Insert the fork securely and make a cut above the wing joint through the body frame. **Lower right:** After the horizontal cut is made, slice downward with straight, even strokes, beginning halfway up the breast. When the knife reaches out above the wing bone, the slices will fall free.

is in the expectancy! And such expectancy can be built up as a result of this personal supervision of the turkey of the day.

It's just old fashioned if you have a freezer to be doing any of the actual food preparation on Thanksgiving Day. Whether your dessert is to be steamed pudding, pie, or both, get it done ahead of time, then freeze it. Do the same thing with the rolls, cranberry sauce, and vegetables. There's so *much* difference in the time needed to just prepare foods for serving over the time required for the entire preparation. Plan to visit with the company that comes to your home to share the day with all your household. They will be disappointed not to have some leisurely time with you.

Get the bread for stuffing—if you like fine bread crumbs for stuffing, spread the bread out on cooky pans. Crisp-dry in oven at below browning temperature, about 200°. If you have a food grinder attachment for your electric mixer, be sure to use it. Both of these jobs can be safely done by the younger folks in the family with few directions and little supervision. And again, if you who have a freezer and like corn bread (or biscuits) mixed with the stuffing, why not make the extra bread today, when you have more time, and store it for stuffing time.

If you have an electric coffee maker you use for company days, get it out and freshen it up. Put it through one coffee brewing cycle with water. Empty, dry, and give it a thorough airing.

The electric mixer is as good an extra pair of kitchen hands as you have on the place. If you haven't oiled it for a while, get your book of instructions out and apply the single drops (not squirts) where indicated. Don't forget the platform base which holds the mixing bowl. Better look at the beater blades, too. If any of them are bent, get a replacement on the next trip to town so you can be sure of putting the fluff into such turkey attendants as mashed potatoes and squash.

For any one who has been putting off getting an electric dishwasher, there's no month that offers quite so many opportunities to give a dishwasher a real workout! You get thoroughly acquainted with the variety of items it will wash with the extra food preparation and clean-up that goes with November.

Measure the shallow roasting pan you will be using for your turkey. Or if you will be using an electric roaster, then measure the insert pan not only for length, but height from bottom of pan to top of cover. Put these measurement notes into your purse so that when the bird is purchased or pulled out of a flock, you know it will fit your roasting facilities. It can upset a household terrifically if on *that* Thursday morning you find the already stuffed bird can't even be squeezed into the pan.

Look up the instruction book for your appliance on roasting fowl. A good turkey can be ruined by improper roasting. A constant low, dry temperature of 300°-325° will give you a nicely browned, tender, uniformly cooked bird, with little noticeable shrinkage and more juices than at a high temperature. If you've never tried it you might like to grease the bird lightly with a thin open-meshed

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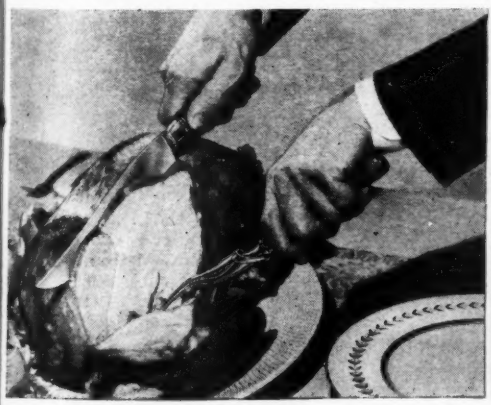
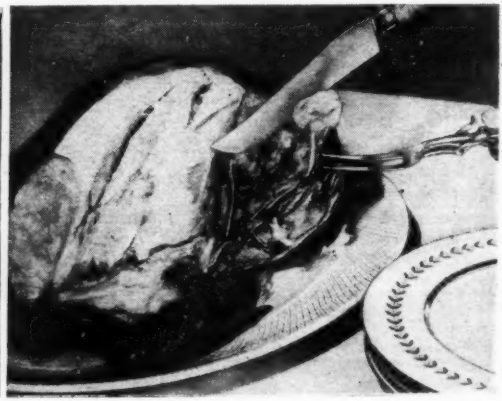
Have you ever thought what is back of our great turkey farms? A Thanksgiving turkey actually means much more to a family than just an extra good meal. Ever since that first Thanksgiving feast of the Pilgrims the turkey has been as powerful as a Christmas tree in building and tying together family unity with traditions. And it's all these family traditions which contribute to our national strength! It's for that reason we say every American of us has a stake in Thanksgiving Day. And every farmer of you in the turkey business is doing more than just putting meat on the table!

—NAN SHAW

Left: Continue slicing the white meat, transferring the slices to a side plate or platter until the crest of the bone is reached. **Right:** Cut a window in the oval formed by the back and breast bones at the spot where the thigh was removed and spoon out the stuffing. If the amount of turkey and stuffing is not sufficient to serve everyone at the table, turn the bird around and duplicate the carving procedure on the other side.





cloth. Cover the bird with this same fat-moistened cloth so as to hold the grease to the skin. Place the bird on a rack to keep it out of collected juices and to allow heat to circulate freely around the bird for even cooking. You do not need a pan cover.

Today's turkeys, like those on the front cover, are more dependable for flavor and tenderness, due to management and feeding of flocks. When you put such birds into a modern electric, heat-controlled, insulated, oven you can follow a time table for judging the approximate roasting time.

Stuffed Weight	Oven Temperature	Total Cooking Hours
8 to 10 lbs.	325°	3 to 3½
10 to 14 lbs.	325°	3½ to 4
14 to 18 lbs.	300°	4 to 4½
18 lbs.	300°	4½ to 5
20 lbs.	300°	5 to 6

An unstuffed turkey requires about 5 minutes per pound less roasting time. Stuffing increases weight from 2 to 3 pounds. In scheduling your dinner, allow an extra 20 minutes for making gravy and arranging the turkey on the platter. Many folks who enjoy carving think they do a better job if the roasted turkey has a chance to rest and settle before meeting the table crowd in the dining room.

And if you could bring yourself to do it—give the guests as well as family members something to do either before or after the meal. It makes people happier and more at home when they have helped. Getting jobs organized takes a little thinking time, but do this while you're sitting down. And again—let the family help make out the plan.

A good way to do this is to make out slips with jobs marked on them. Then assign family members who are familiar with the house to work with guests. Remember the men have a knack for mechanical things, so let one of them be the person to connect the vacuum cleaner to sweep up. And if some of the guests ask to bring a covered dish, salad, or dessert, let them. Then remember not to duplicate it.

I'd like to say this to you men: If you've never carved your turkey at the table, try it this year. Make it an extra memorable day! Just keep this in mind—what your children will remember is not *how* you did it, but that you *did* it. If you've never done it, then here's a tip. While the turkey is raw and uncooked, take the row of carving pictures and locate the areas you will be attacking with slicing knife and long-pronged fork. And if you'd feel more sure of yourself on Thanksgiving Day, place the pictures on the dining table in front of you at least until you get started.

It's a good idea to get out the platter you will be serving the turkey on. Check that it too will be adequate to hold the bird and permit carving. Such a creation of rare beauty deserves to be marched to the dining table with pomp and ceremony, carved and served with a gay note and a happy Thanksgiving.

Floor That Fixed a Kitchen

Its Replacement Led to Complete Modernization

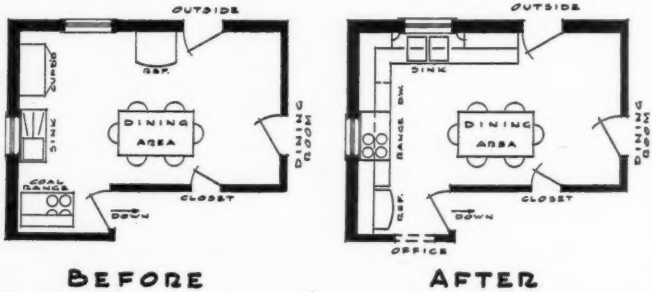
By EDNA A. STEPHANY

After a visit to the Harold C. Herr farmstead, you come away with the feeling that here, indeed, is a farmer and his wife who are truly partners in a highly successful venture. And the children, too—Joanne, Kenneth and Carl—are all members of this happy family team that are working together to build a better future on their 187-acre farm.

The Herrs can take justifiable pride in what they have accomplished during the 11 years that they have lived on their Golden Guernsey Dairy Farm near Kirkwood in Lancaster County, Pennsylvania.

When they took over the farm, the house was extremely in need of repairs and there were rat holes in several rooms. There was no electricity and a pump in the yard was their only source of water.

First improvements made were to have the house wired for electricity and to install running water. They put up with the many other inconveniences, making gradual changes as they could. But the many expenses involved and the wartime shortages of many materials slowed their progress. An electric range was installed for summer use some years ago, but the old wood range had to be kept as a source of heat for the kitchen in winter.



Here are floor plans of the Herr's kitchen. Structural changes included the raising of the window (on the long wall) and breaking through a door to the combination office and play room area. When the heating unit was first installed, a kitchen radiator was located beneath the window on the long wall. In remodelling, this radiator was relocated under the workspace adjoining the outside door, to allow for the sink.

Five years ago, an oil burning hot water heating system was installed and later a 52-gallon electric water heater was put in. Mrs. Herr says, "It's a pleasure to have enough hot water for all my needs now and we are never out of hot water." And what a difference there is in having the kitchen warm any time of a 24-hour day.

The kitchen was next for consideration. Mr. Herr, who is considered a very progressive farmer in this area says, "The ladies are like the men. They want everything as convenient and practical as possible for their work." The Herrs had been collecting ideas from magazines and had lived with the many hardships in their old kitchen for so long that they knew exactly how they wanted it to be. So, when it became evident that the kitchen floor was in such bad shape that it had to be completely replaced, modernization finally got underway.

At first, Mrs. Herr thought she didn't want a dishwasher. But a local appliance dealer convinced her that it would not be a completely modern kitchen without this labor-saving appliance. Now breakfast dishes are scraped and stacked in the dishwasher until after lunch when the dishes from both meals are done in a single load. Although the dishes are normally stored in the cupboard directly above the dishwasher, clean dishes are often left in the machine until time to reset the table for the next meal.

This spacious kitchen provides ample room for comfortable eating and the "L" shaped arrangement of equipment makes for step-saving convenience. Wall cabinets on right side of picture are old cabinets remodelled to harmonize with the new one. Radiator is under work space at extreme right.

By having the open space under the counter, covering the radiator, there's plenty of ventilation and warmth for towel drying. It also makes it a convenient spot for using trash containers without opening and closing cabinet doors. By having the dry and wet trash near the outside door, family members can easily empty the trash outdoors.

Double views and cross ventilation are always desirable in a farm kitchen. Here in this kitchen all Mrs. Herr needs to do is look up and out one of the two windows if she hears a car in the driveway or a call from the farm buildings. Many times the question comes up as to what kind of a window to place over the kitchen sink, especially in an old house with old fashioned windows. The casement type window requires no straining of back muscles for Mrs. Herr to open or close. Even though window is to the front of house, by keeping the glass sections divided the window is not conspicuously different from the outside.

Above: Mrs. Herr wanted a double bowl sink for quick cooling of vegetables and fruits before packaging—almost a daily process in this farm home. The storage and work space to the right of the sink are for freezer preparation and materials.

Right: It was decided to place an under counter dishwasher unit at right angles to the sink which is easily accessible for scraping dishes before placing them in the dishwasher. Clean dishes are conveniently stored in cabinets above the dishwasher.

One of the extra dividends an electric range offers is placing of a window for views and daylight over the full width of the range. It's pleasant to look out on the changing seasons in the fields and watch the stature changes in the livestock as you fry the chicken, flip pancakes or pull cookies from the oven.

Lighting, too, is modern in the Herr kitchen. A recessed soffit fixture is directly over the sink and the full length fluorescent light on their new electric range gives good light for cooking. The center ceiling fixture provides general illumination and is controlled by a silent wall switch.

At present, Mrs. Herr has a conventional washer in the basement and she washes twice a week in summer. Sometime in the future, the Herrs plan to get an automatic washer. Space for this has been provided in the kitchen along the wall between the outside door and the dining room door.

Working in this farm kitchen is a real pleasure and the time and energy saved add much to the family's good way of living. The Herrs say that the real thrill is the satisfaction of what can be done with an old home through good planning—even though it may take a long time.

Kitchen work is no drudgery for 10 year old Joanne. She finds baking is easy, the kitchen is cool and comfortable, and clean-up is a cinch with this modern equipment. The combination refrigerator freezer has doors hinged at the left which open toward the base cabinet for easy loading and unloading. Here Mrs. Herr keeps frequently used frozen food and store bought items such as ice cream and frozen juices. Other frozen foods she plans to use are brought up ahead of time from the 16 cubic foot freezer in the basement.

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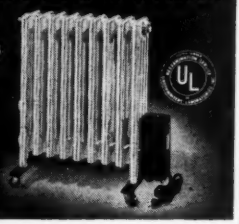

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Pasteurizers Make it Safe

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Gaylord Martinson, Dane County, Wisconsin, is a good farmer, keeps a clean barn and has a fine dairy herd of registered Holsteins. He has his cows tested regularly, yet

The Martinson's pasteurizer is simple to operate, takes little space, and stores easily. However, in this home it's usually on the counter, as shown here, where it's always ready for use.

Brucellosis has occurred occasionally. Martinson got undulant fever, himself, about two years ago from handling infected cows. Because he knew the symptoms of the disease, he more or less diagnosed the problem himself. But, he had a blood test made to be sure and found his fears were correct. In addition to the suffering caused by high temperatures and chilling, Martinson estimates his medical bills were $15.00 per day.

During his period of illness, Martinson never once worried about his wife and children getting the disease from drinking milk. Several years ago they bought a home pasteurizer and, as Mr. Martinson says, "It was good to know my family was drinking safe, pasteurized milk."

Today pasteurization is easy and inexpensive. Modern science has produced several commercial appliances which enable you to pasteurize milk right in your own kitchen and make good milk safe milk.

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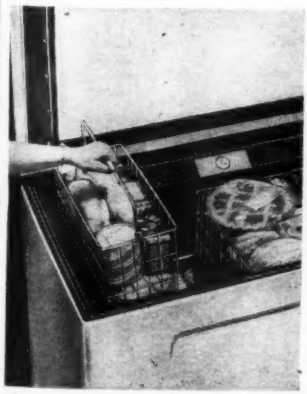
Of course, you reduce the time required for shopping and for preparing food for cooking—that's a great convenience.

But the real economy lies in



the fact that it is more economical to freeze and store home-grown fruits, vegetables, or meats and home-prepared

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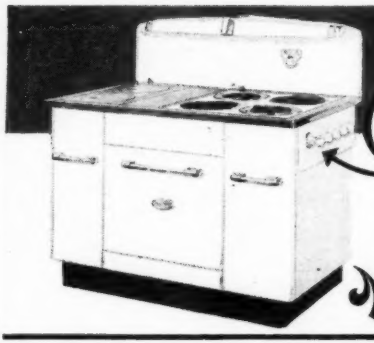

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dishes than it is to purchase the same foods in small quantities at regular retail outlets.

A study of home freezer owners was made by the University of Arizona and the Production and Marketing Administration to learn how Arizona homemakers used their freezers, whether there were economies in their use, and what buying practices would lead to economies.

If you hope to get the fullest benefits of economy and convenience from your home freezer, foods should be stored in quantity and in wide variety, according to the researchers. It is usually more economical to purchase commercially frozen fruits and vegetables in quantity from firms that offer complete varieties and assortments at quantity discounts than it is to make frequent purchases of identical frozen products at retail. When home freezer owners purchased meats in quantity, such as a side or quarter, the more desirable cuts were slightly less expensive than when purchased at retail, and the less desirable cuts were about the same price.

MASTITIS IN COW CAUSES STREP THROAT INFECTION

Mr. Clarence Schroeder

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Name.....

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Foil Reduces Range Soil

Follow These Directions For Its Use

There has been considerable interest and questioning about the use of aluminum foil with the electric range. It is important for you to understand how to use aluminum foil before proceeding with it.

TOP OF THE RANGE

Bright, shiny reflector pans keep electric range surface units operating at maximum efficiency. If yours have become dull through age, or if you want to protect new ones, line these pans with aluminum foil cut to fit. Cut or tear the foil, being sure to *make a center opening* and any other opening so the foil will exactly conform to shape of pan. Tuck the edges of the foil underneath the openings. Do not let foil extend up so that it touches the heating unit or any contacts.

These bright, shiny liners will catch drips and food that falls into them. Wipe them out occasionally, then discard them when they become badly soiled.

Some manufacturers are currently using enameled reflector pans. They recommend that these do *not* be lined.

Foil may be used to hold biscuits, buns, rolls, juices of double crusted pies when heating them directly on enclosed surface units. These foods should be wrapped in one or more thicknesses of foil with the edges tightly sealed. Turn the package once or twice to ensure even heating. Use simmer to low heat. This method of heating foods is sometimes convenient to use and avoids soiling dishes—but don't expect perfect results.

New ranges are equipped with one or more high speed surface units which reach a high temperature very quickly. Do not

When using aluminum foil linings for reflector pans on your electric range, cut a piece of foil to approximate shape and press into pan. Be sure to make a hole in the center and anywhere else necessary to conform to the shape of the pan without covering any openings.

place aluminum-foil-wrapped foods directly on these units unless they are set at the lowest heating position.

Baking potatoes wrapped in foil on surface units of your range is not particularly successful. Potatoes should be baked in the range oven, in a Dutch oven on the surface unit, or in the well cooker.

OVEN

Even the best of cooks sometimes experience difficulty with juicy fruit pies, scalloped vegetables and casserole dishes boiling over. To catch liquids that run over in the oven, place a piece of aluminum foil somewhat larger than the utensil holding the food on the shelf beneath the one on which the food rests. The edges of the foil may be turned up. Do this after the food has been in the oven for part of the baking time and begins to show signs of running over. In some ranges it may interfere with browning to some degree, but the convenience of catching these drips offsets this slight difference.

Lowering the temperature will stop the boiling over. Use of an adequately large pie plate or baking pan is a good preventive. A method of preventing pies from running over which many homemakers like is to crimp a strip of foil 1½ inches wide all around the outer edge of the plate. This may be tucked under the edge of the crust.

Do not cover the entire shelf or the greater portion of it with aluminum foil, as this will interfere with heat circulation.

Do not place a large piece of foil on the bottom surface of the oven or in any way line the bottom of the oven.

In electric range ovens having the concealed heat type of unit, covering the bottom surface reflects the beat back on the enamel finish, causing it to craze.

Practically all other electric ranges have a bottom unit open in the center. Closing these openings in an electric range seriously interferes with heat circulation and may damage the enamel.

Whenever you have to protect the oven bottom or the surface of the bottom unit from boiling over pie juices or the

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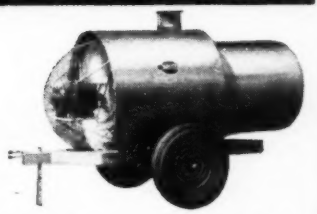

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AGRICULTURAL DIVISION

PIQUA, OHIO

like, it is best to place the foil on a lower shelf and to avoid using a piece that covers a large portion of the shelf area.

BROILING

No one likes to clean the broiler pan. Lining the bottom of the broiler pan with aluminum foil does away with this messy job.

To line the broiler pan: Join two pieces of the 12-inch-wide aluminum foil with a tight double fold. Fit it into the bottom of the broiler pan, letting it extend up the sides nearly to the top. If wider foil is available, one piece can be used in the same way. Place the rack in position, put the meat on the rack, and broil as usual. Do not place foil on top of the rack. For good broiling, the melted fats must be allowed to drain into the bottom of the pan. After broiling is finished, pick up the foil, drain off the melted fat, and either discard the foil or save it for storing scraps for the family pets.

Broiling fish: Whole fish, steaks and thick fillets may be broiled on the foil-lined regular broiler pan as above. Fish is sometimes difficult to handle without breaking. Brush the foil lightly with melted fat where the fish rests.

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Let's Make the Gravy Good

Part of the glory of the Thanksgiving turkey or chicken dinner is a result of the smooth, rich gravy that tops the potatoes and stuffing. Leftovers crave gravy, too, so make lots of it and make it good.

To be sure that the gravy is at its tasty-best, be sure to use all the flavorful browned bits in the bottom of the roaster pan. Those that cling to the rack on which the chicken or turkey was roasted can be cooked off easily by turning the rack upside down in the pan before adding a bit of the liquid.

Another flavor tip is to use the broth in which the giblets have been cooked, the stock from water-cooking the neck of the chicken or turkey, and liquid from canned mushrooms in place of part of the milk. Because these ingredients have so much flavor of their own they can be used in addition to the milk to make a larger amount of gravy. However, for each additional cup of liquid, increase the amount of flour and fat by two tablespoons.

Gravy improves with cooking, so don't rush it to the table too quickly. Let it cook a full 10

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minutes. The turkey won't get cold if it is kept in a warm place either on a platter or in the top of the roaster. As a matter of fact, a resting period for the roasted bird makes the carving easier. Another caution on behalf of good gravy—don't serve it without first tasting it.

Preheat the gravy bowl, so the gravy can be served piping hot. Here is a basic gravy recipe for chicken and for turkey.

Turkey Pan Gravy
Makes 6 cups

¾ cup turkey drippings
¾ cup flour
6 cups milk
Finely chopped giblets or mushrooms (if desired)
1 tablespoon salt
½ teaspoon pepper

Chicken Pan Gravy
Makes 4 cups

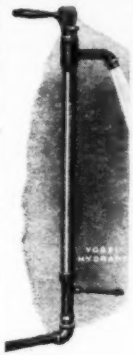
½ cup chicken drippings
½ cup flour
4 cups milk
Finely chopped cooked giblets
1½ teaspoons salt
¼ teaspoon pepper

Pour drippings from pan in which bird was roasted. Put the correct measure of drippings in a skillet. Add flour, mix well, and brown slightly. Put 2 cups milk in roasting pan and cook up browned bits. Gradually add this and remaining milk to mixture in skillet. Stir constantly with pancake turner to make smooth gravy. Add giblets, salt, pepper, and other seasonings if desired, for a well-flavored gravy. Cook 10 minutes. If a thinner gravy is desired, reduce the flour to ½ cup for turkey gravy and to ½ cup for chicken gravy.

Singe the Easy Way

Here's a tip for singeing the Thanksgiving turkey. Pour one or two teaspoonfuls of alcohol (rubbing variety) in a tin lid, such as a coffee can lid. Place the tin in the sink and ignite alcohol with a safety match. Hold the turkey over the flame and constantly change position to expose all surfaces. This flame will burn about 3 to 4 minutes and will singe off hairs quickly without any carbon deposits.

"Because it transforms many working hours into leisure, son. That's why it's called a transformer."



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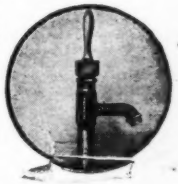

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HI—

Did you ever wonder what makes a winner? There can be several answers. Luck plays her part—but she is fickle. The biggest part of the answer lies with the winner himself. It consists of the desire to win and the refusal to quit. And that last is the most important single factor. Don't stop trying. There are always new fields to conquer. Four young farmers were singled out for this year's highest FFA awards. Walter Vogel of Ohio received the title of Star Farmer of America. John Reynolds, Jr. of Tennessee, Frank Arnold, Jr., of New York, and George Warmington of Oregon were named Regional Star Farmers. It's not strange that each of them had previously been singled out for other forms of recognition. Winners don't quit. And when you don't quit, you must go forward. Do you want to be a winner? It rests with you.

Kenneth V. Anderson

Saluting the Winners

FFA National Farm Electrification Awards

Bryce O. Anderson, 16 year old Vo-Ag senior from Imperial, Nebraska, won this year's Future Farmers of America Foundation's $250 national award for outstanding achievement in Farm Electrification. The award was presented at the FFA 25th annual national convention. Three other Future Farmers received FFA Foundation checks of $200 each as regional Farm Electrification winners. They are Tillman Gibbs, 17, Ranbourne, Alabama; Robert D. Biggs, 17, Felton, Delaware; and Arden Olsen, 17, Kalispell, Montana.

The Future Farmers of America Foundation which sponsors Farm Electrification and other awards for FFA members, receives its funds through contributions by business and industrial concerns, organizations and individuals. Each of the winners honored at the national convention already had received a $100 Foundation award as state winner in Farm Electrification. Here is a brief account of the four winners' activities.

The work of BRYCE ANDERSON that won the national award in Farm Electrification for him also resulted in complete electrification of the Andersons' 540 acre home farm. Mr. and Mrs. O. H. Anderson, his parents, bought the farm six years ago and built a house on it, but the rural electrification line was a mile away and Mr. Anderson decided against installing an electrical system at that time because of the cost of materials and labor. When Bryce was a sophomore student of vocational agriculture in 1950, he convinced his parents that he could save 40 percent of the cost by doing the work himself, and they made plans to go ahead. Before he was through, Bryce had wired the shop, barn, cattle shed, chicken house, garage, and pump-house. A good guy to have around wouldn't you say?

Bryce's work on the home farm was so successful that his brother-in-law hired him to install the electrical wiring on his farm, and a similar job was done for a neighbor. His report of accomplishments also includes a list of several electrical items built, including two pig brooders, a cesspool pump, three poultry water heaters, a seed grader, and a drill press. He has learned to service many kinds of electrical equipment, and has repaired motors, irons, and other appliances. His time has not

been spent entirely in electrical work. Young Anderson has an outstanding farming program including a sow and litter, two dairy heifers, eight acres of alfalfa, 20 acres of wheat and 15 acres of corn. He has served one-year terms as secretary and president of the Imperial FFA chapter.

TILLMAN GIBBS, who completed three years of vocational agriculture at the Ranbourne,

Alabama, high school last spring, has put his electrical skill to work developing labor-saving and productive appliances for use on the home farm. His major accomplishment has been the construction of thirty-six thermostatically-controlled heat lamp chick brooders, enough brooders to handle more than 20,000 chicks. Twenty of the brooders were made for his own 10,000 chick farming program, ten for his father's use, and six for a neighbor. Construction and installation included careful adjustment of the lamps to provide uniform heat for the chicks over a wide area. The brooders were fitted with thermostats arranged so that a constant temperature is maintained automatically.

Tillman owns three electric motors, including two that he had bought as junk and rebuilt, and he has built several appliances that put the motors to work. When water in the well supplying his poultry house ran low he devised a rope well pump. The motor turns a pulley which rotates a circular rope that has one end dipping into the water 40 feet below. The rope whips water up to the pulley where it is thrown off into a barrel, and thence is piped to the poultry house. He made a 14-foot-long portable elevator that saves three-fifths of the labor required to clean the brooder house; converted an old hand grindstone to electric power, and made a bench saw that uses one of his portable motors. Needing a better lamp in his study, he built one in the school's farm shop.

He did the installation work on a 380-foot automatic chick feeder for his father; installed the electric wiring for three poultry houses on neighbors' farms, rewired one neighbor's home, and has performed numerous repair jobs on electrical equipment. Included in his accomplishments was a successful repair job on the school's bell system, and installation of an electric water heater in the school lunch room. Young Gibbs' farming program this year included 10,000 broilers, a brood sow, and three acres of corn.

ROBERT BIGGS, is a senior student in vocational agriculture at the Caesar Rodney School, Camden, Delaware. He is farming in partnership with his father, J. D. Biggs. Robert has had a major part in repairing and rebuilding electrical equipment on the farm for the past two years. He has replaced some of the old electrical wiring, installed a yard light, installed a new electric pump to supply water for the home and barn, and has systematically overhauled electric home appliances to put them in safe working condition.

At school Robert has had the responsibility of regulating and servicing the electric brooder that the FFA chapter operates for broiler production, the electric chicken picker and electric scalder. He is an active member of the school club that does the electrical work in connection with school plays, assemblies, and other special programs. He wired the home farm shop for lights and electrical equipment; added several wall outlets in the home for his mother's convenience; did the electrical work in installing an electric milk cooler, and installed lights in the 500-

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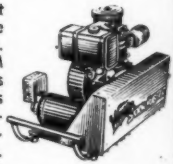

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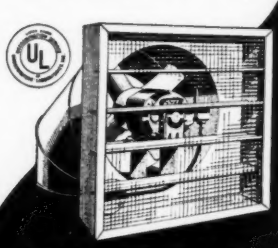

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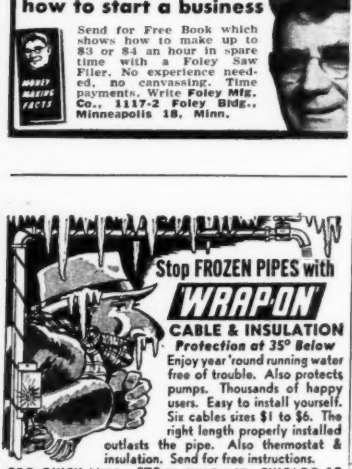

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hen laying house. Robert has served two years as reporter of his FFA chapter, is an active member of the Grange and the Delaware Crop Improvement Association. His farming program this year included a cow and heifer, a sow, 10 acres of corn, two acres of peas, five acres of barley, five acres of lima beans and five acres of soybeans.

ARDEN OLSEN was graduated from the Flathead County High School at Kalispell, Montana, last spring. He is recognized in the community as an accomplished electrician. Arden's first work in electrification began several years ago when he helped his father, E. H. Olsen, install wiring for their barn. Shortly afterwards, Arden undertook wiring the milk house alone, and when that job passed inspection he went to work in earnest to put electricity to work on the farm.

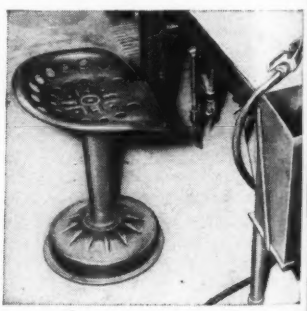
The Olsens' old-fashioned house had a kitchen that was fourteen feet square, had the stove in one corner and the sink in another, with five doors for entry. Mr. Olsen and Arden remodeled the home, using part of the old kitchen for a bathroom, adding part of it to the living room, and using the rest of it for a closet and hall, then built an entirely new kitchen. Arden did all the plumbing and wiring for the job, including replacing an old magnetic circuit breaker with a new range panel having four circuits and a 220 volt outlet for the new electric stove. Modern lights were provided for the kitchen and bathroom, with convenient plug outlets for use with appliances.

Some of young Olsen's other work with electricity included motorizing the lawnmower, and putting other motors on the sheep shearing machine, the grinder, fanning mill, and other equipment. He installed wiring in the granary, brooder house, tractor shed, and garage, built an electric lamb brooder, a homemade power saw, and a grain elevator. He converted two old kerosene lamps to make attractive electric table lamps, and has performed many repair jobs on electrical equipment at home and in the community. Arden is accomplished in the use of the electric arc-welder. With it he built the framework of the marquee for the school's new vocational agriculture building, a snowplow for the high school, angle-iron frame for the school truck bed, and a trailer for a portable irrigation pump owned by the FFA chapter. The pump, incidentally, has a 25-horsepower motor using a 440-volt electric circuit, and Arden did all of the electrical work on its installation.

The Montana Future Farmer has held the office of vice president in the Flathead FFA chapter, is a director of the local Wool Growers Association, and an assistant leader of the local 4-H Club. His 1952 farming program included 28 sheep, a cow and heifer, four hogs, 13 acres of wheat, seven acres of oats and a hive of bees.

Stool of a Thousand Uses

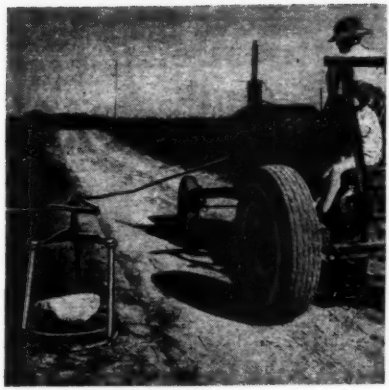
That's what Edward Bernreuter, Nashville, Illinois, calls this homemade affair, fashioned from an old brake-drum, a section of pipe, and the seat from an old cultivator. Bernreuter uses the stool in his farm workshop, especially when he is welding. "Why work standing up?" he queried. He has several of the same type on his farm.

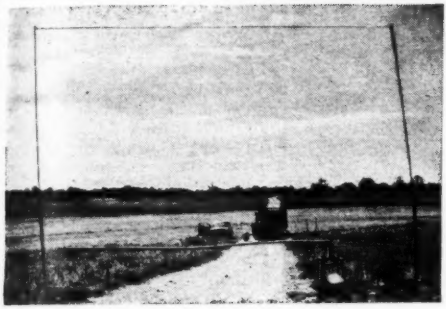


Look around the farm. Chances are you can find the simple materials required. Then go to it. It will make a simple useful project. You'll get some good welding experience, too.

There's a Spark To This Gate

By HOWARD CLAPPER





The swinging rod of the gate carries current from an electric fence. Spool insulators keep the current from running to ground through the pivot supports. Springs return rod to normal closed position after vehicle passes.

On E. J. Logan & Sons' Brookside Farms, Mt. Gilead, Ohio, traffic between pasture strips and cultivated strips flows freely with no stopping to open and close gates.

Push the light weight swinging rod open with the tractor and, after you're through, the springs pull it back to the closed position. Cows pasturing on the grassland strips do not trespass for the swinging rod mounted on a tripod welded to an old wheel is connected to the electric fence. Spool insulators on the tripod legs keep the current from going to ground through the wheel. The current needed to charge the fence on the other side of the gate goes up and over on overhead supports.

In one day this past summer 44 loads of grass ensilage were hauled through the grass strip where the cows were grazing. The gate saved 176 stops, to open and shut the gate (44 loads x 2 stops equals 88 plus return trips equals 176). Really a handy and simply constructed gadget.

OUTSIDE RUNNING WATER ALL WINTER

IOWA FREEZELESS HYDRANTS

Order yours now and give your stock running water ALL winter. Avoid costly, time-wasting freeze-ups.

★ Toggle action prevents dribbling.
★ Hydrant drains below frostline.
★ No springs or screw threads to wear out. Save on upkeep.

Install on ANY farm water system. Ask your dealer, or write. . . .

WOODFORD HYDRANT CO.
Des Moines 17, Iowa

Take the DRUDGERY OUT OF DAIRYING with PATZ EQUIPMENT

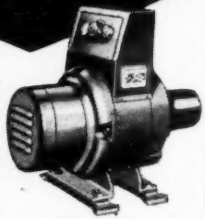
CUSTOM MADE:

BARN CLEANER
SILAGE UNLOADER
ALL PURPOSE ELEVATOR
SIMPLE BLOWER CLAMPS

For information and literature write to

PATZ CO., Pound, Wis.

Laugh at power failure!
FAIRBANKS-MORSE
Tractor-Driven
GENERATOR



This tractor-driven generator on your farm is assurance of light and power to run brooders, milkers, incubators, water systems, water heater, furnace controls and other electrical equipment, no matter how long you are without power from the high line.
Fairbanks-Morse tractor-driven generators are available in capacities from 1.5 kw. to 12 kw.
Why take a chance? The damage just one power failure can cause, can easily cost far more than what you'll pay for this high quality generating set! See your Fairbanks-Morse dealer today! Or, write for facts to Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE
a name worth remembering when you want the best

GENERATING SETS • HOME WATER SERVICE AND LAUNDRY EQUIPMENT • ENGINES • HAMMER MILLS • MAGNETOS • MOTORS • MOWERS PUMPS • SCALES

Thru Sept., Oct., Nov. Only
$4
TRADE-IN
allowance on your old hydrant toward the purchase of a new

ENTERPRISE
NON-FREEZING
GROUND
HYDRANT

TODAY your old hydrant earns you $4 toward purchase of the newest, finest. Operates valve—and drains — below frost line! All inside parts removable. Threaded ¾" spout. Serves all outdoor needs. See your plumber, hardware or implement dealer today.

See the JK Non-Freezing Wall Faucets for homes, too! At your dealers or write
THE JAMES KNIGHTS CO., Sandwich 5, Illinois

Questions and Answers

Two Family Service

▶**Question:** *Will a 110 volt service from the transformer be heavy enough to provide for two families in the same building?*
Mrs. I. S., Indiana

▶**Answer:** No. Such a service is no longer considered adequate for a single family, much less two. In order to be able to take advantage of electric equipment now available each apartment should be provided with its own 110/220 volt entrance, with a minimum size of 60 amperes.

Tractor Operates Milker

▶**Question:** *How can I hook up my tractor to operate my milking machine in an emergency?*
D. G., Wisconsin

▶**Answer:** You can install supplemental pulleys and jack-shafts so that the milking machine may be operated from the pulley on the tractor. Check your vacuum pump's speed and also that of your tractor pulley so that you may figure the proper size pulleys for use on the jack-shaft.

A simpler method consists of operating the milker from vacuum supplied by the intake manifold of the tractor. In this case the intake manifold plug is replaced with a pipe nipple soldered to a male hose connection. A short piece of milker hose is provided with a female hose connection. To operate the milker connect the short milker hose to a vacuum line stall cock. Connect this by means of a length of garden hose to the tractor manifold fitting. To start the tractor close the stall cock and crimp the garden hose near the tractor. When tractor is running open stall cock slowly because a sudden demand for vacuum may stall the engine. Tractor develops highest vacuum at slow speed. Run motor at slowest RPM at which it will operate satisfactorily. Two individual milkers can be operated at once in this manner.

Wiring Inspection

▶**Question:** *Should a 20 year old wiring job be checked for safety?*
Mrs. L. W. P., New York

▶**Answer:** From the point of deterioration of the wiring itself the system should be all right. However it would probably be wise to have it checked from the standpoint of capacity. Over a 20 year period a lot of electrical equipment can be added to the home resulting in electrical demands in excess of the wiring system capacity. The rural representative of your power supplier will be glad to check your wiring system with you.

Heat for Plants

▶**Question:** *If we built on a small room for house plants and flowers, what would you suggest for warmth?* Mrs. L. C. H., Illinois

▶**Answer:** If your home has a central heating system it should be extended to supply heat for the growing room. In addition, install soil heating table in planting beds. These can be thermostatically controlled to maintain the desired soil temperature. With such a system air temperature can be held fairly low.

Lamps for Pig Brooders

▶**Question:** *How many heat lamps can be put on common wiring for pig brooding use?* M. H. E., Wisc.

▶**Answer:** Current recommendations are that infra-red lamps used for pig brooding should be served by a #12 wire 20 ampere circuit. The maximum load should not exceed 80% of the capacity of the circuit which is equivalent to 1750 watts. That means that there should be no more than seven 250 watt heat lamps used on such a circuit.

POULTRY TIME SWITCHE
Get MORE Eggs Prices Are HIGH
Uniform Lighting, Fall Winter, Assures Mo Eggs, Healthier Ho
EASILY SET— FULLY AUTOMATIC
With or Without Dimmer Circuit — All Electric Manually Wound
Switches Serviced $2.50 min.
4 MODELS—$11 to
Automatic Electric MFG. CO.
AT YOUR DEALERS OR WRITE
10 State Street MANKATO, MINN.

STOP RUSTY RED WATER
USE MICROMET
SEE YOUR PLUMBER OR PUMP DEALER FOR FREE BOOKLET
WRITE TO: CALGON INC.
HAGAN BLDG., PITTSBURGH 30, PA.

FUN FOR ALL—the whole family can take part in this contest. CASH PRIZES will be awarded for the best suggestions for a last line to complete the verse at the bottom of this page.

What Would YOU Say?

Rhyme Contest

Awards for June-July Contest

With Electric Fans we'll live with ease
While summer heat prevails,
We'll be assured of a steady breeze

? ? ? ? ? ?

The Winning Fourth Lines

FIRST PRIZE—$25 CASH

"When Nature her's curtails!"
Jane Maxwell
R. D. 3, Delaware, Ohio

SECOND PRIZE—$10 CASH

"When mugginess assails."
Alanson C. Kimball
Pine River, Wisconsin

Five Consolation Prizes—$3 Each

"Like 'summers' in Fairy tales."
Miss Patricia A. Hawkins
R. F. D. 2, Batavia, N. Y.

"Man's peace from power hails!"
Mrs. Bert A. Ritchart
R. F. D. 1, New Lisbon, Wisc.

"A Blessing my family hails!"
Mrs. Edgar Estus
Great Valley, N. Y.

"As fresh as sylvan vales."
Mrs. J. M. Rasmussen
Magrath, Alberta, Canada

"And make old Sol turn tails!"
Donna J. Lamb
R. F. D. 1, New Harmony, Indiana

Honorable Mention:

Mrs. G. B. Harrison, 1028 10th St., Huntington, W. Va., Mr. Fred Klovstad, R. R. 1, Milan, Minn., Mr. Harry Kozier, R. F. D. 1, Pitman, Pa., Lyle L. Krzyske, Waltz, Michigan, Donald Lipps, R. R. 1, Runnells, Iowa, Mrs. Marvin, R. F. D. 3, Columbus, Wisconsin, Mrs. W. E. Miller, Logan, Kansas, Mr. John Nash, Martin Road, R. F. D. 1, North East, Pa., Vera D. Sherman, Box 164, Lancaster, N.H.

RULES—NOVEMBER CONTEST

Seven cash prizes will be awarded for the best last line to complete the verse in the coupon below. Your suggestion should rhyme with the second line.

The first prize will be $25 cash; the second prize $10. In addition, five consolation prizes of $3 each will be awarded for the best last line furnished.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

All members of the farm family to whom this magazine was sent may enter but each contestant may submit only one line.

Question "A" must be answered.

Entries must be sent to the Contest Editor, ELECTRICITY ON THE FARM Magazine, 8 So. Dearborn Street, Chicago 3, Ill., before Dec. 10.

The decision of the judges is final and all entries become the property of ELECTRICITY ON THE FARM Magazine.

Winning names and entries will be announced in the February 1953 issue.

Send your entry on the coupon or make out a similar form on a plain sheet of paper or government postcard.

Frost and freezeups now expected
Need not happen to you
Watts can keep your home protected

? ? ? ? ? ?

My suggestion for a fourth line to the above verse is:

.....

(A) Describe briefly the most interesting and unusual application of electricity on your farm:.....

.....

.....

.....

My name is.....

R.F.D.....Post Office.....

County.....State.....

Sec. 34.64, P. L. and R.
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Dayton, Ohio
Permit No. 243

Mr. H.N. Young,
Director, Agric. Exp. Sta.,
Polytechnic Institute,
Blacksburg, Va.

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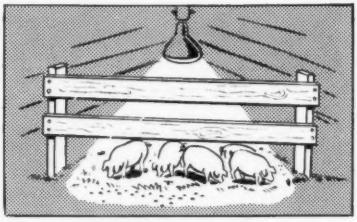
ELECTRICITY ON THE FARM
21 W. 40th St., New York 18, N.Y.

FOR *BIGGER PROFITS*... PUT THE HEAT ON *"Old Man Winter"!*

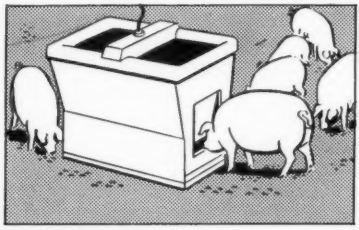
Electric HEAT LAMPS

Cut death rate due to chilling of newborn livestock
Add warmth to milk house and farm shop
Eliminate freezing of pumps, pipes and water fountains
Brood chicks, pigs, lambs and calves



Electric WATER WARMERS

Keep egg production high
Keep milk production high
Help livestock gain weight



Electric LIGHTING

Lengthen livestock feeding hours, faster gains
Increase winter egg production
Reduce accident hazards
Speed winter repairs and daily chores

● Electric heat and light are leading the way to increased winter farm production.

Infra-red heat lamps, providing life-saving warmth to newborn livestock, are saving hundreds of thousands of dollars in profits for prudent farmers annually. Electric heating cable or tape, and electric water warmers, are eliminating losses that used to be caused by frozen water in stock tanks and poultry fountains. Electric water heating in the dairy alone is of inestimable value to the farmer.

Electric lighting on the farm is especially valuable in winter in helping to maintain profitable production. A few well placed lights lengthen livestock feeding hours and speed up gains . . . increase winter egg production, banish darkness from the farmyard, and permit farm work to be completed more quickly and easily, with much less hazard.

Maintain YOUR winter profits . . . take FULL advantage of your dependable, low-cost electric service. Remember . . .

CONSUMERS PUBLIC POWER DISTRICT

BETTER SERVICE LOWER COST